

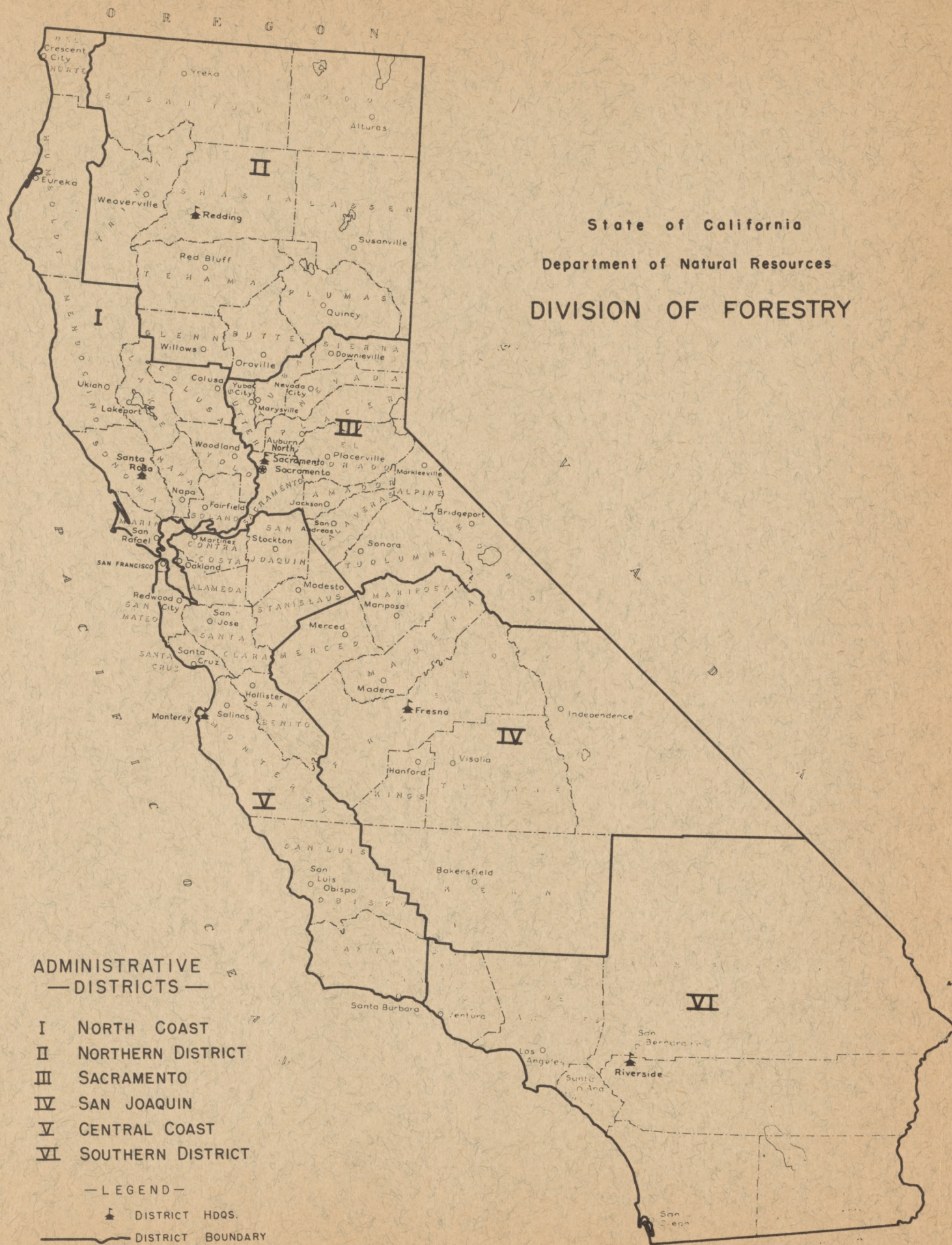
STATE
OF
CALIFORNIA



FOREST FIRE REPORT
1957
DIVISION OF FORESTRY



DEPARTMENT
OF
NATURAL RESOURCES



CALIFORNIA DIVISION OF FORESTRY

1957 FOREST FIRE SEASON

1. CHARACTER AND EXTENT OF THE FIRE SEASON

Upon those lands directly protected by the California State Division of Forestry there were 1,986 fires during 1957, these fires burned a total of 124,316 acres. In comparison with the 1947-56 average, fire incidence was 8% below the average and area burned 22% below.

There were 70 fires (8% below average) in the 300 acres or larger class, burning 100,573 acres (11% below the average).

Although the statewide fire statistics indicate a below normal year for occurrence and a very good year on acreage burned, there were various contrasts of conditions in the six administrative districts.

The North Coast District had an excellent season, both the incidence and acreage burned were well below average, and except for the years 1948, 1953 and 1956, this was the best year during the 1947-57 period. Fire incidence totaled 468 which is 17% below the average and the area burned totaled 24,489 acres, which is 49% below.

In the Northern District both the incidence and acreage burned were above the average. The number of fires totaled 417 which is 5.5% above the average, and the area burned totaled 30,948 acres which is 16% above. Except for the years 1950 and 1955 this acreage burned was the highest during the 1947-57 period.

In the Sacramento District the incidence was below average, while the acreage burned above average. The incidence totaled 510, which is 2% below the average, and the area burned totaled 22,884 which is 18% above average. Except for 1949 this was the highest acreage burned for this District during the 1947-57 period.

The San Joaquin District had a slightly below normal season on incidence and an excellent season on area burned. The incidence totaled 137 which is 3.5% below the average and the acreage burned totaled 6,836 which is 49% below the 1947-56 average.

The Central Coast District also had an excellent season, both the incidence and acreage burned were well below average. Fire incidence totaled 179 which is 11% below the average, and the area burned totaled 14,968 acres which is 39% below. Except for 1956 this is the smallest amount of acreage burned during the 1947-57 period.

The Southern District had one of their better years, both the occurrence and area burned were well below normal. Fire incidence totaled 275 which is 17% below the average and the area burned totaled 22,191 acres, which is 22% below the 1947-56 average.

The following table compares percentagewise, the occurrence and acreage burned during 1957 with the 1947-56 average, for each of the six administrative districts:

<u>State Direct Protection Area</u> <u>Zones I and II</u>						
<u>District</u>	<u>Occurrence</u>			<u>Acreage</u>		
	<u>1957</u>	<u>1947-56 Average</u>	<u>% of Increase or Decrease</u>	<u>1957</u>	<u>1947-56 Average</u>	<u>% of Increase or Decrease</u>
North Coast	468	565	- 17.0	26,189	51,540	- 49.0
Northern	417	395	+ 5.5	30,948	26,591	+ 16.0
Sacramento	510	520	- 2.0	22,884	19,426	+ 18.0
San Joaquin	137	142	- 3.5	6,836	13,427	- 49.0
Central Coast	179	201	- 11.0	14,968	24,522	- 39.0
Southern	275	330	- 17.0	22,191	27,728	- 20.0
Statewide	1986	2154	- 8.0	124,316	158,600	- 22.0

There were two outstanding features during the season. One was the lack of lightning activity throughout the Sierra Nevada and Northern California mountain ranges. Statewide Lightning fire incidence during 1957 totaled 91, and except for 1954, is the lowest since 1948. The second was the Santa Ana Task Force, consisting of 25 fire trucks, 10 bulldozers with transports, 5 bulldozer service units, 5 pickups, and some specialized equipment, along with a total of 70 men. The purpose of this group was to reinforce the local protection forces during the fall months when strong, dry, desert winds cause extreme fire danger. Southern California has annually been burning an excessive amount of acreage during October, November and December, resulting in unacceptable losses to watershed and improvements. Statistics show that approximately 36% of their

annual loss has occurred during this fall period. This augmentation of local forces can largely be attributed to the acceptance of the Division's "1956 Fire Plan" which was approved by the State Board of Forestry, included in the Governor's budget and acted upon favorably by the 1957 session of the Legislature.

A review of the weather experienced during the 1957 fire season reveals the following:

May - For the State as a whole it was one of the wettest Mays in climatological history. Thunderstorm concentrations were numerous and quite heavy in Northern California, but lightning was no problem because of the wet and green fuels.

June - The very wet conditions that prevailed over much of California during May were alleviated somewhat in June when temperatures were generally above to well above normal. Except for two general thunderstorm days in Northern California the thunderstorm activity for the State was below normal.

July - During the first period in July, temperatures in Central and Southern California were abnormally warm, and in the Northern part of the State low humidities and strong winds were the principal causes for California's highest fire danger up to this date. Thunderstorm occurrence in Northern and Central California was about normal for the month, and except for four or five general storms in the northern part of the State, most of the thunderstorm activity was very widely scattered. In Southern California surges of tropical air entering from the Southeast produced an above normal amount of thunderstorm activity during the month.

August - Except for a brief period of high temperatures from the 15th to the 18th, the entire month of August was marked by below average temperature. It was a month of unusually low fire danger in Northern and Central California, while the weather in Southern

California was characterized by above normal temperatures over the mountains and coastal sections, and below normal temperatures over the interior. Thunderstorm activity during August was about normal in the South, well below normal in the North while the Central part of the State had practically no thunderstorm activity during the entire period.

September - During this month Northern and Central California experienced the highest fire danger of the entire season. September opened with temperatures in a rising trend which continued until reaching a peak on the 8th. By the 10th the heat wave was breaking and temperatures dropped to below normal and except for a brief period of above normal temperatures between the 20th and 23rd, the fire danger was below normal for the remainder of the month. Many areas experienced light showers during the middle of the month, and on the 26th, light to heavy rains set in and continued until the end of the month. Southern California experienced a variable weather pattern and like the Northern and Central part of the State, this included two periods of high fire danger. Although mild Santa Ana conditions existed during this second period, general light winds prevailed in most areas and prevented the development of an extreme situation. Several times during the month an influx of unstable air brought heavy thunderstorms, lightning strikes, and light sprinkles or rainshowers in Southern California.

October - For the State as a whole October was an unusually cool and rainy month, and except for light showers along the Central Coast section south of the Monterey Bay area, most of the State received moderate to heavy showers. The fire season ended on October 15 in the North Coast, Northern, and the Sacramento Districts, and on October 30 in the San Joaquin and Central Coast Districts.

November - The month began with a continuation of the unstable rainy conditions

and precipitation was a daily occurrence over the Southern California District during the first week of the month. A more stable situation developed the second week, but because of the residual moisture, no more than an average fire danger developed. From the 20th through 25th, severe Santa Ana conditions prevailed over the entire District, with some areas reporting wind gusts in excess of 90 miles per hour.

December - After a general rain in Southern California, the State Forester terminated the fire season on December 5, 1957.

The following table summarizes the fire record for State Direct protection areas and for all Clarke-McNary lands within the State:

Annual Forest Fire Statistics

<u>Year</u>	<u>State</u> <u>Direct Protection - Zones I & II</u>			<u>Statewide</u> <u>All Clarke-McNary Areas</u>		
	<u>Total No.</u> <u>Fires</u>	<u>Man-</u> <u>Caused</u> <u>Fires</u>	<u>Total</u> <u>Burned</u> <u>Acreage</u>	<u>Total No.</u> <u>Fires</u>	<u>Man-</u> <u>Caused</u> <u>Fires</u>	<u>Total</u> <u>Burned</u> <u>Acreage</u>
1947	2,473	2,422	256,472	2,669	2,539	202,318
1948	1,973	1,898	133,223	2,134	2,023	124,206
1949	2,608	2,385	132,253	2,726	2,313	117,020
1950	2,264	2,118	303,393	2,556	2,078	270,150
1951	2,159	1,858	148,360	2,439	1,880	137,851
1952	2,263	2,058	120,974	2,422	1,936	83,967
1953	2,080	1,932	125,150	2,214	1,850	152,670
1954	2,017	1,955	140,072	1,993	1,866	104,488
1955	1,941	1,801	161,510	2,070	1,701	209,141
1956	1,758	1,566	64,617	2,127	1,607	87,868
1957	1,986	1,895	124,316	2,038	1,895	110,182

On all Clarke-McNary throughout the State there were 74 fires of 300 acres or larger. These fires burned acreage as follows:

Forested Land	5,260 acres
Non-Forest	<u>96,639</u> acres
Total	101,899 acres

2. PROGRESS MADE IN EXTENDING PROTECTION TO NEW AREAS AND ESTABLISHMENT OF BETTER PROTECTION IN OLD AREAS:

A. New Areas:

In 1957, an area of 170,991 acres was added to the Calaveras Ranger Unit in District III. Within the acquisition unit, there is a total of 110,149 acres of private land, 59,830 acres of National Forest and 1,012 acres of land belonging to the Bureau of Land Management.

The following installations and crews were added to provide fire protection for the area:

1. Arnold Forest Fire Station, Crew #3
2. Skull Creek Forest Fire Station, Crew #1
3. Folsom Forest Fire Station, Crew #1
4. Blue Mountain Lookout
5. Skull Creek Patrol

B. Old Areas:

In the 1956-57 Budget substantial additions were made to the California Division of Forestry Protection Organization. These were as follows:

(1) Five Patrolmen:

Fortuna Aerial Patrol	Humboldt Ranger Unit
(increased from one to two men)	
Kelsey-Cobb Patrol	Lake-Colusa Ranger Unit
Howard Forest Aerial Patrol	Mendocino Ranger Unit
(Increased from one to two men)	
Oasis Patrol	Fresno Ranger Unit
Box Springs Patrol	Riverside Ranger Unit

(2) Two new crews:

Irvine Lake, #3 Crew	Orange Ranger Unit
Morongo, #1 crew	San Bernardino Ranger Unit

(3) Two lookouts, taken over from another agency:

Quartz Hill	Siskiyou Ranger Unit from
	U.S. Forest Service
Round Top	Santa Clara Ranger Unit from the
	East Bay Municipal Utility Dist.

(4) One Assistant State Forest Ranger:

Sunol	Santa Clara Ranger Unit
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(5) Conversion of nine part time dispatcher positions to year-round coverage requiring the addition of 3.3 man years of dispatcher in the following ranger units; Lake, Napa, Butte, Fresno, Tulare, Santa Cruz,

Riverside, Orange and San Bernardino.

- (6) Sixteen foremen to be used as combination warehousemen and relief dispatchers in:

Sonoma Ranger Unit	Santa Clara Ranger Unit
Mendocino Ranger Unit	Monterey Ranger Unit
Humboldt Ranger Unit	Fresno Ranger Unit
Shasta Ranger Unit	Tulare Ranger Unit
Butte Ranger Unit	Orange Ranger Unit
Tehama Ranger Unit	San Bernardino Ranger Unit
Calaveras Ranger Unit	San Diego Ranger Unit
San Luis Obispo Ranger Unit	Riverside Ranger Unit

- (7) In order to stabilize employment of equipment operators and truck drivers, sufficient funds were secured to employ yearlong all forestry equipment operators and one driver for each Forest Fire Station, plus a seasonal driver to man the second truck at all two truck stations during the declared fire season.

- (8) The 1957-58 suppression organization is as follows:

229 Crews* (54 - #1)
(38 - #2)
(110 - #3)
(19 - #4)
(8 - #5)

36 Patrolmen

79 Lookouts (Three are manned by Lookout-Patrols)

49 Bulldozer-Transport Units

(28 Large, D-7 o/e)

(21 Medium, D-4 o/e)

*With the adoption of the 1956 Fire Plan, the designation of crews changed from 4, 9 and 13 man crews to #1, #2, #3, #4, or #5 crew. The #3, #4, and #5 crews have 2 fire trucks.

(a) #1 Crew: 1.5 foremen; 1 driver; 3 firefighters

(b) #2 Crew: 1.5 foremen; 1 driver; 6 firefighters; 1 cook

(c) #3 Crew: 1.5 foremen; 2 drivers (1 yearlong; 1 seasonal);
6 firefighters; 1 cook

(d) #4 Crew: 1.5 foremen; 2 drivers (1 yearlong; 1 seasonal);
8 firefighters; 1 cook

(e) #5 Crew: 1.5 foremen; 2 drivers (1 yearlong; 1 seasonal);
10 firefighters; 1 cook

C. Fire Weather:

(1) Project Skyfire.

At the conclusion of our 1956 experiments in the suppression of lightning from cumulus thunderstorms, we discussed our program with "Project Skyfire" staff in Missoula and reviewed their operations for the same period.

It was agreed at this meeting that we were not duplicating their effort, and continuance of our project in cooperation with theirs would be of mutual benefit.

Two of "Project Skyfire's" staff people spent several weeks at our Davis headquarters and shops early in 1957 to continue their work on silver-iodide generator calibration, and to cooperatively develop a generator of greater capacity and simpler design.

As a result of our success in developing a more effective and easily operated ground generator, the Division decided to expand its program into two separate operations. One, continuing an aircraft operation on a larger scale, utilizing four aircraft over the Coast Range from Santa Rosa to the Oregon border; and two, a ground generator operation in the Sierra Nevada, covering 6,000,000 acres of Plumas, Lassen, Shasta, and Modoc counties.

The four aircraft were each assigned to a segment of the Coast Range. Two of the aircraft were contracted for by the Division, and the Forest Service cooperated by permitting the Division to install generators in two aircraft for which they had contracted.

The ground operation consisted of 50 generators located at existing State and Forest Service facilities. The Forest Service cooperated with the Division by operating the generators when required, and, on request of the Division, the area "protected" by the generator grid was the north half of an area having a relatively high lightning incidence. It was felt that such an operation would provide for a statistical comparison of effectiveness.

In addition, the Division entered into an agreement with the California

Forest and Range Experiment Station to evaluate our program through employment of a statistical meteorologist.

An appraisal of last year's operation has not yet been completed.

(2) Fire Climate.

A contract was initiated with the California Forest and Range Experiment Station to conduct a fire climate study. The objective of this study will be to describe local fire weather patterns that will accompany a particular weather situation for a specific topographic unit; to determine the effects of topographic features and vegetative cover on local fire climate patterns; and to prepare practical field guides for use by fire-fighters.

(3) Fire Danger Rating.

The development by the California Forest and Range Experiment Station began in 1955 as a cooperative program between the California Division of Forestry, the United States Forest Service and the U.S. Weather Bureau. At present the system has produced the Burning Index, which is a product of the weather variables as they affect rate of spread and the burning intensity. In turn, rate of spread or perimeter increase (not just forward spread) may be thought of as the length of fire line necessary to control the fire, and the intensity factor as the width of line needed. At present the System produces three Indexes, one each for Grass (Fine Fuels), Brush (Medium Fuels) and Timber (Heavy Fuels). The original fuel classifications were related to the effects of the various moisture factors as measured by fuel moisture, relative humidity and the state of the vegetation, whether green, curing, or dead.

After the planning, research and office development of the system, it was field tested in a Pilot Model on a small scale in 1956. The data and results obtained from the test, combined with further statistical analysis of weather data, were used to further revise the system in the winter of 1956-57 and to tentatively establish a number of rating areas on a statewide

basis. During the summer of 1957 an expanded program of field testing was undertaken with all of District I a Pilot test area and Pilot Models in Districts II, V, VI and a combined area for III and IV. The U.S.F.S., Park Service and the U. S. Army have participated.

Field personnel have been asked to evaluate the Burning Index and to submit their opinions on its use and applicability. This information will be used to further refine the system and its attendant procedures and forms to attain the goal of placing it in Statewide operation by the summer of 1958.

3. IMPORTANT CHANGES IN PROTECTION PLANS,
ADDITION OF PERMANENT PERSONNEL, ETC.:

A. 1956 Fire Plan Revision:

As a result of partial implementation of the 1956 Fire Plan, the following increases in man-months were received in the Fire Control classes in 1957:

1. Forest Firefighter Foreman	280
2. Forest Firetruck Driver	911
3. Forestry Equipment Operator	311
4. Forest Firefighter	94
5. Forest Fire Lookout	18
6. Camp Crew Cook	13
7. Forestry Work Project Foreman	323

B. Training:

One of the major steps in the Division's long range plans in training was taken this year when two full-time Training Centers were established. One of these is located at Ramona in San Diego County and the other at Sutter Hill, Amador County. One Ranger and one Associate Ranger are assigned to each center. In addition, many of the classes are conducted by line people from the two Districts in which the centers are located.

The first classes were started in early November. This group consisting of civil service truck drivers, was graduated in December, following a five week course devoted to the skills and knowledges considered basic for Forest Fire Truck Drivers. Four more five week classes are scheduled for new employees in the truck driver class during the balance of the fiscal year. According to present plans the centers will be closed for three months during the fire season and will probably re-open in October or November.

Basic guide lines for the curriculum were established by the Division's Training Committee and approved by the Executive Council. While the first two years will probably be devoted to teaching new and present employees in the truck driver class, it is planned that future classes will be held for the other positions in the Division. At the present time each class consists of 20 members. Fire fighting skills are accented at the centers.

Two major studies were undertaken by the Training Committee this year. The first of these was the writing of a divisional Training Policy. This task has been completed and the proposed policy has been submitted to the Executive Council. The second task was a study of organizational problems created by our standby system. This, too, was completed and was submitted to management for use in organizational planning.

The Training Committee is undertaking the development of a system for reporting training and setting basic standards for minimum training at the various levels.

Most of the Division's personnel has now completed the Division's course on Defensive Driving. First year results gave statistically satisfactory results. Only 27 recordable accidents occurred during the period covered by our survey. This is only one accident in each 285,000 miles of driving, the best record achieved by the Division since records have been kept.

Conference Leadership and Participation courses have now been given or are planned for the near future for all field personnel from the Associate Ranger level up. These are five day courses conducted on a high participative basis.

The Division's "Flying Squad" training program has been greatly expanded during the past year. Eighteen courses are now offered to the Districts. These are presentations by the Sacramento staff and are designed for management personnel in the field.

Among the other courses added this year were "Records Management", "Punitive Action Procedures", "Issuance Procedure", "The Right of Way Manual", "Capitol Outlay Budgets", "Use of Aerial Tankers", "The Fire Danger Rating System", "Lightning Control", "Emergency Revegetation Program", "Basic Range and Watershed Management", "The Fire Prevention Research Program" and others.

A noticeable increase in the training programs developed in District and Ranger units was reported during the past year.

Extensive programs particularly in fire fighting skills were conducted in every Ranger Unit.

Fifty seven merit award suggestions were received during 1957. Cash awards were made for three of these suggestions and seven are still being investigated.

C. Forestry Honor Camps:

The 1957-58 Budget provided for two more adult honor camps. One is to be located on the Jackson State Forest at Chamberlain Creek. The second is to go in the Tehama Ranger Unit and a site has to be procured. The Parlin Fork Honor Camp was expanded to accommodate twenty-five more inmates bringing the camp population up to eighty-five inmates.

An Assistant Deputy State Forester, to coordinate the "Honor Camp" program, was added to the staff of the State Forester.

There were no further Honor Camps activated in 1957, however, the inmate population was increased at two camps. There were twelve active CDC Honor Camps and three Youth Camps, the latter having three additional spike Camps. The Department of Corrections provided 705 inmates for the twelve adult camps and the Youth Authority provided 265 wards for the CYA Camps.

D. Personnel Changes:

The 1957-58 Budget provided 4 positions at the Assistant Deputy State Forester level on the Sacramento Headquarters staff. 2 were reclassifications and 2 were additional. Areas of responsibility for these 4 new positions are:

1. Forest fire research and equipment development and maintenance programs.
2. Agreements with other fire fighting agencies, fire dispatching, fire plans, facility evaluation, communications, and fire statistics.
3. Principal responsibilities are development of budgetary program and procurement procedures, and in addition other phases of fiscal management as a staff assistant to the Deputy State Forester.
4. Forestry honor-camp program and the development of standards for construction and maintenance of roads, fire breaks, and telephone lines.

A State Forest Ranger I was provided to assist in the coordination of the program of agreements with other fire control agencies, 2 clerical positions and a delineator were provided because of work load, and in addition a State Forest Ranger II to give direct assistance in coordinating and conducting the forest fire research program. A State Forest Ranger I was added to coordinate small watershed management program under Public Law 566.

In the Fire Prevention Education function an additional supervisor of law enforcement to direct and coordinate the civil and criminal law enforcement activities in the field, and a State Forest Ranger I to assist in the development and distribution of fire prevention education aids were added to the staff. An intermediate stenographer clerk is also additional, principally to assist the supervisor of law enforcement.

At District Headquarters level, 6 State Forest Ranger I positions were added to be in charge of fire control activities, automotive management, construction and maintenance of field service facilities, and so forth. 6 clerical positions were provided to assist in the overall work load.

Two State Forest Ranger I positions to be in charge of training centers in the Central Sierra and Southern California districts, and 2 Associate State Forest Rangers to assist them, were provided.

Seven Associate State Forest Rangers, 2 in the North Coast District and 1 each in the other 5 districts, and 2 Assistant State Forest Rangers in the Southern California District were added as assistant fire prevention officers to work directly with local residents in problems of fire prevention and law enforcement.

The Budget provided the following revision in the Field Services Function:

1. One Assistant State Forest Ranger to provide more adequate administration in southern Contra Costa County and northern Alameda County.
2. Conversion of 9 part time dispatcher positions to year round coverage.
3. A combination warehouseman and relief dispatcher in the largest ranger units measured by work load. For these positions a forest fire fighter foreman is added for each of 16 units.

4. Clerical positions were added to the ranger units on the basis of work load.
5. A sufficient number of trained year-round crew leaders and equipment operators for existing crews, requiring the addition of 1164 man months.
6. 86 man months to establish the proposed Irvine Lake Forest Fire Station in Orange County.
7. 51 man months to establish the proposed Morongo Forest Station in San Bernardino County.
8. 149 man months for the assumption of fire protection responsibility in the Calaveras area.
9. 9 man months of forest fire lookout for the Quartz Hill Lookout in Siskiyou County.
10. 96 man months of forestry equipment operator for operation of 5 medium bulldozer-transport units, additional this year.

In the Forestry Honor Camps function, 2 positions of Forestry Work Project Supervisor were transferred from the capital outlay program to support, as two new camps were anticipated to be in operation in 1957-58, Puerta La Cruz and Pilot Rock. In addition, seasonal man months were provided for more adequate supervision of inmate work crews and to provide sufficient trained personnel for operation of heavy equipment.

Forest Management received 1 additional forest technician to direct and coordinate the forest pest control programs, and 1 Assistant Forest Technician to provide technical forest management information to small timberland owners in Butte and Plumas Counties. One Assistant Forest Technician was also provided for Mountain Home State Forest in Tulare County, and an intermediate typist-clerk provided on a work-load basis for Jackson State Forest in Mendocino County.

Range Improvement function reclassified a Senior Forest Technician position to Assistant Deputy State Forester to provide coordination of the Division's activities in watershed management and revegetation research, direction of the range improvement program and administration to the forest and range management section in the absence of the Deputy State Forester. One forest technician was added to provide direct supervision and coordination of the range improvement activities.

The Division's forest fire suppression strength was increased as

follows:

<u>Class</u>	<u>Yearlong Employees</u>	
	<u>1956-57</u>	<u>1957-58</u>
Crew Foreman	321	360
Patrol Foreman	33	36
Forest Firetruck driver	196 (75 County Contract during Winter)	246 (79 County Contract during Winter)
Forestry Equipment Operator	76	114

PERSONNEL CHANGES

Summary of Additional Positions:

Assistant Deputy State Forester	2
State Forest Ranger II	1
State Forest Ranger I	11
Associate State Forest Ranger	9
Assistant State Forest Ranger	3
Forest Technician	2
Assistant Forest Technician	2
Supervisor of Law Enforcement	1
Forestry Work Project Supervisor	2
Forest Fire Dispatcher	3.3
Forest Fire Fighter Foreman (Warehouseman-Relief Dispatcher combination)	16
Intermediate Stenographer Clerk	12
Intermediate Account Clerk	1
Intermediate Typist Clerk	6
Intermediate Clerk	.4

For comparative purposes with other states, the Division of Forestry top (after four years of service) pay grades now are:

DIVISION OF FORESTRY PERSONNEL

Authorized Strength

All Functions

<u>No.</u>	<u>Title</u>	<u>Monthly Salary</u>
1	State Forester	\$ 1,200
1	Chief Deputy State Forester	1,100
11	Deputy State Forester	950
11	Assistant Deputy State Forester	782
1	Training Officer Grade I	745
17	State Forest Ranger Grade II	710
32	State Forest Ranger Grade I	644
48	Associate State Forest Ranger	613
138	Assistant State Forest Ranger	556
12	Forestry Trainee (3-Step Range)	481
7	Senior Forest Technician	710
24	Forest Technician	644
18	Assistant Forest Technician	556
24	Forest Fire Dispatcher	505
1	Supervisor of Law Enforcement	745
2	Supervisor of Conservation Education	710
6	Forest Fire Prevention Officer	644
3	Forestry Equipment Engineer	644
19	Forestry Work Project Supervisor	613
116	Forestry Work Project Foreman	505
396	Forest Firefighter Foreman (396 Yearlong)	481
246	Forest Firetruck Driver (3-Step Range) (246 Yearlong)	436
114	Forestry Equipment Operator (114 Yearlong)	505
1173	Forest Firefighter (Seasonal Only)	341
116	Forest Fire Lookout (Seasonal Only)	358
206	Camp Crew Cook (28 Yearlong)	376

4. FIRE EQUIPMENT AND IMPROVEMENTS:

A. Equipment

1. Inventory:

During 1957 (**) the Division had in operation the following equipment:

<u>Transportation</u>		<u>Firefighting Equipment</u>		<u>Construction and Maintenance Equipment</u>	
Sedans	104	Pumpers:		Maintainers	23
Station Wagons	25	Firetrucks FWD	138	Dump Trucks	27
Panels	15	Firetrucks Conv	235	Cement Mixers	32
Pickups	208	Pickup Pumpers	38	Compressor Trucks	3
Stakesides	161	Bulldozers:		Compressor Trailers	20
Jeeps	61	Large	47	Front End Loaders	8
		Medium	24	Miscellaneous	24
		Transports:			
		Large	30		
		Medium	24		
		Misc. Equipment:			
		Wheel Tractors	6		
		Discs	13		
		Small Tractor			
		w/plow	2		
		House Trailers	9		
		Various	8		
		Special Service	31		
		Miscellaneous	26		

** Up to July 1, 1958 - end of present fiscal year.

During 1957, (57-58 F.Y.) the following vehicles were received and placed in service:

18	Sedans
6	Station Wagons
37	Pickups
33	Stakesides
13	Firetrucks FWD
2	Firetrucks Conv
7	Tractors
6	Transports
18	Mobile Service Units
54	Jeeps
3	Motor Graders
7	Dump Trucks
1	Concrete Mixer
3	Air Compressors
17	Pickup Pumpers
8	Loaders

2. Development and Research:

A new position (Ranger Grade II) was established to coordinate the Division's fire research program. A sum of \$50,000 was appropriated by the legislature to support this program during the 57-58 fiscal year. Two new projects were initiated and a third (weather modification for lightning suppression) was intensified.

Preliminary work was started on a fire protection economic study through a contract with the University of California, School of Forestry. The objective of this project is to establish, by area, the kind and magnitude of the economic values protected by the fire control system. The effects of different alternative levels of protection on these values will be estimated and comparisons made with the costs of alternative protection systems.

The Division cooperated with the Forest Service in the Aerial Attack program by assisting the Arcadia Equipment Development Center in the engineering and design of a tank installation for surplus TBM bombers. Upon completion of the preliminary design work the Division financed, built, and installed, the first tank in a Forest Service plane at the Davis shops. The first showing of the tank was at the Western Air Attack Review in Redding in May, and was subsequently assigned to the Southern California zone. At the last report the plane had operated all summer in this area and was now in Region 8 for their fire season. Two calibration tests of aircraft tank gates were made, one at Willows and the other at the Orange County Airport in which the Division participated.

Through the joint encouragement of both agencies, a commercial manufacturer developed a simple ejector type mixer for mixing sodium-calcium-borate with water as a fire retardant. A number of tests were held at the Davis shop in arriving at a uniform and acceptable mix. Late in the season a new fire retardant was tentatively tried, which indicated the mixer could be used with a variety of powders, however, each would require its own orifice for water and chemical.

In June, extensive long hose lay tests were held in which the California Forest and Range Experiment Station and the Arcadia Equipment Development Center

participated. All the conventional methods were used, including a helicopter with hose lay trays, over a pre-determined course 10,000 feet long in varying terrain and fuel types. It was concluded the helicopter could lay hose on almost any topography, and the presence of dense timber presented little problem other than the additional amount of hose required to reach from the ground to tree tops and back to ground again. Also, it was evident the laying of hose by hand is in reality not the insurmountable problem it appears to be on steep ground with dense growth.

A new technique for handling, storing, and using cotton jacket fire hose was developed and tested. The technique greatly simplifies the entire process of using hose in a variety of ways without the necessity of special loading or packing for each method. Should further tests prove entirely successful, the techniques may be adopted throughout the Division.

Two sizes of demountable fabric water tanks were developed and tested, 1,000 gallon and 2,000 gallon sizes. The smaller unit converts a standard dump truck into a mother tanker (with the addition of a power take-off driven gear pump). The larger unit is to be carried (empty and folded) on a medium transport (D4 size). Should the need for additional volumes of water develop after delivery of the tractor to the fire, the tank may be unfolded on the bed of the transport and filled with water.

B. Improvements:

1. Structures

- a. Barracks: 2-18 man barracks constructed, one in Nevada Ranger Unit at Nevada City, a second in Tuolumne at Sonora.
- b. Combination nine-man barracks and messhall constructed in the Amador Ranger Unit at Pine Lodge.
- c. C.D.C. Barracks and Messhall extensions at Parlin Fork in Mendocino County. Inmate population increased from sixty to eighty-five men.
- d. Automotive Shop building, Mendocino Ranger Unit at Howard Forest.
- e. Warehouse - San Luis Obispo Ranger Headquarters.
- f. Transport Building - El Dorado Ranger Unit, Pilot Hill.

- g. Lookout residence remodeling - Placer Ranger Unit, Mt. Howell.
- h. (2) Radio Repeater Vaults Fresno Ranger Unit, Joaquin Ridge;
San Luis Obispo Ranger Unit, Branch Mt.
- i. Paint storage building - Riverside District Headquarters.
- j. Grounds developments - at five sites:
 - 1. San Diego Ranger Unit, Julian
 - 2. Napa Ranger Unit, St. Helena
 - 3. Mendocino Ranger Unit, Howard Forest office site.
 - 4. District II, Crystal Creek C.D.C. Camp, Shasta Ranger Unit
 - 5. District III, Vallecito C.D.C. Camp, Calaveras Ranger Unit
- k. Gas and Oil Shelter - Placer Ranger Unit - Auburn.
- l. Utilities:
 - 1. New Well, Fresno Ranger Unit, Squaw Valley.
 - 2. New Well, Santa Clara Ranger Unit, Del Puerto.
 - 3. New Well, Shasta Ranger Unit, Shingletown.

2. Maintenance and Improvements:

Our maintenance program continued as usual with the assistance of inmate labor and work being accomplished by crew labor during periods of low fire hazard and in winter months. Budgetary economies are made possible in many maintenance and improvement projects by using materials produced and fabricated in honor camps.

3. Roads, Telephone and Power Lines:

Fire Road mileage shows no change in total mileage over the previous calendar year.

District I	361.5
District II	1046.7
District III	618.0
District IV	481.2
District V	357.5
District VI	<u>556.0</u>

3420.9 miles (Statewide Mileage)

Telephone Lines:

Total Mileage of Telephone lines made little change in the 1957 calendar year. Six miles of metallic line was salvaged in District I from Howard Forest to Willits and eight miles of metallic line was added in District V from Antelope to Emmet in the San Benito Ranger Unit.

1957 Telephone Line Mileage by Districts

	<u>Ground Miles</u>	<u>Metallic Miles</u>
District I	155.0	109.0
District II	225.7	390.1
District III	124.0	471.3
District IV	16.0	238.0
District V	82.0	174.5
District VI	<u>.0</u>	<u>198.2</u>
Statewide Total	602.7	1581.1
<u>Grand Total</u>	<u>2183.8 miles</u>	

Power Lines - 13.0 Miles Statewide Total.

The net gain in Power Line mileage in 1957 was 1.2 miles. 2.5 miles of line was built to Mountain Home State Forest in Tulare County, and 1.3 miles was transferred to Pacific Gas and Electric at Mt. Zion in Amador. Total Power Line mileage maintained - 13.0 miles.

4. Land Transactions:

Acquisition proceedings were completed for six parcels of land. Three were for Forest Fire Stations, Spanish Flat in Napa County, Sutter Hill in Amador County, and Rincon in San Diego County. The Fredonyer Lookout site in Lassen County was acquired. Property was acquired in Tehama County for an Honor Camp site. Additional land to provide water source was acquired for the Fawn Lodge Station in the Shasta-Trinity Ranger Unit. Lease negotiations were completed for only two parcels, one for a new Honor Camp - Pilot Rock, and one for extension of the area included in an old lease for an existing Ranger Headquarters at Howard Forest in Mendocino County.

5. Maps:

An Administrative map for the San Luis Obispo Ranger Unit was completed and printed. The San Diego Ranger Unit map was revised and prepared for printing. A District V administrative map was prepared and printed. This was the first of a new series of district maps that are to be printed for each district. Considerable time was expended by the drafting office in the preparation of charts and audio visual aids for training. Numerous charts were prepared for the Board of Forestry.

C. Radio:

In the 1957-58 fiscal year the radio net was augmented by 278 pieces of radio equipment. The full complement of the Division of Forestry's radio equipment is reflected in the table below;

	<u>Base Station</u>	<u>Mobile Relay</u>	<u>Mobile Land</u>	<u>Portable Unit</u>	<u>Mobile Unit</u>	<u>Handie Talkie</u>	<u>Remote Control</u>
District I	9	14	1	37	202	108	8
District II	8	7	1	34	173	91	4
District III	10	4	1	42	165	92	6
District IV	8	4	1	24	122	69	3
District V	6	7	1	26	134	83	6
District VI	6	10	2	35	208	121	6
Administration	1	-	-	1	4	2	1
Total	48	46	7	199	1008	566	34

Grand Total 1908

5. FIRE PREVENTION:

For the first time in several years there was an increase over the preceding year in the number of man-caused forest fires in Zones 1 and 2. The record was, however, below the last five year average. This increase was not the result of any let up in the fire prevention program. To the contrary, educational, law enforcement and hazard reduction programs were more intensified, as can be noted on the statistical records which appear later in this report. Some progress was also made in forest fire prevention research, but not to a point where conclusions can be reached for initiating new or altered methods or programs.

The forest fire prevention program in California is one of cooperation, which makes it impossible to single out the activities for which any one organization is solely responsible. This is especially true in educational phases, but hazard reduction and law enforcement are effected materially. This report, therefore, while dealing principally with Division operations, will include contributions of others on a cooperative basis.

This report will also be divided into two sections for ease and clarity of reporting. Section one will deal with activities of District and Ranger Unit field personnel; section two will comment on the mass media educational program.

1. Field Personnel Activities:

The localized Keep Green organizations and the various protection agencies worked cooperatively but in many instances independently and in the same areas. While this might indicate a duplication of effort, the guide lines were so well drawn that very little duplication was evident.

The following statistics are offered to indicate the concerted effort directed toward fire prevention, and to show the scope of the program and balance in use of available media:

A. Newspaper Publicity.

1. Made 6,388 contacts with the press which resulted in editorials, fire news, and other prevention copy.
2. Made 1,410 news releases.
3. Made 67 contacts with press which resulted in 40 drop ins and 27 sponsored advertisements.

B. Radio Publicity.

1. Participated in 181 radio presentations (talks, interviews and programs).
2. Presented material for 467 short announcements.

C. Visual Education.

1. Distributed 2,271,000 pieces of printed material including posters, leaflets, pamphlets, stickers, etc.
2. Arranged for 350 displays in store windows, theaters and public buildings.
3. Made 1,205 postings on Division of Forestry 4' x 8' highway right-of-way roadside signs.
4. Displayed 58 floats and/or equipment which was viewed by 262,000 people.
5. Made 72 exhibits at fairs which were viewed by 2,011,893.

D. Group Contacts.

1. Presented 1,109 programs with and without films which were attended by 38,500 adults.
2. Presented 1,693 programs with and without films attended by 121,142 children.

E. Training.

1. Held 2,097 training programs with an attendance of 21,800.

F. Personal Contacts.

1. Made 198,000 personal contacts at fair booths and equipment exhibits
2. Made 145,784 contacts during normal work day.
3. Made 48,300 personal contacts during 38,550 man-hours spent on patrol duty.

G. Permits.

1. Issued 101,379 regular burning permits.
2. Issued 479 range improvement permits.

H. Inspections (Zones 1 and 2).

1. Sawmills - 869
2. Other Mills - 110
3. Logging Operation areas - 2,600.
4. Industrial areas (other) - 384
5. Dumps (public and private) - 987
6. Public areas (recreational, school, etc.) - 1,125
7. Residential areas (farm and mountain) - 9,817
8. Mechanical equipment (farm, logging, construction, etc.) - 4,197

I. Hazard Reduction (Zones 1 and 2).

Rights-of-Way

1. State and county highways (disced, burned or treated) - 421 miles
2. State and county highways (disced, burned, or treated in cooperation with others) - 420
3. State and county highways (disced, burned, or treated by others) - 1,069
4. Railroads fireproofed (cooperative) - 128 miles

The following statistical record lists, by percent of total of man-caused fires, locations, causal agents, and causes of forest fires occurring in the Division of Forestry's direct protection responsibility area (Zones 1 and 2):

<u>Location</u>	<u>%</u>
Roadside	30.79
Logging and Lumbering Areas	3.37
Wildlands	39.23
Dooryards	12.50
Cultivated Areas	2.81
Railroads	6.53
Dumps	2.36
Miscellaneous	<u>2.41</u>
	100.00

<u>Causal Agents</u>	<u>%</u>
Rancher-Farmer	12.26
Tenant	9.44
Children	11.90
Traveler	22.70
Commercial Transporter	.50
Forest Product Worker	3.57
Construction Worker	2.16
Hunter	8.29
Fisherman	1.51
Recreationist	4.97
Tramp	.95
Railroad & Other vehicles	7.99
Miscellaneous	13.21
Structural Agents	.55
	<u>100.00</u>

Causes

Smoker-Matches-Tobacco	39.42
Debris Burning (non-permit)	3.41
Debris Burning - Permit Escape (Land clearing, incinerators, range improvement, trash burning)	12.15
Vehicle	6.98
Railroad - Mechanical	3.96
Incendiary	14.70
Logging-Slash	.45
Sawmill Burner	.60
Power Line	2.51
Campfires	2.76
Blasting, spontaneous combustion, stationary engine, welding, structural	2.36
Miscellaneous	<u>10.70</u>
	<u>100.00</u>

2. Statewide Cooperative Mass Media Education Program:

The Division and Region 5 again directed the activities of the California Fire Prevention Committee. The membership of the committee was not increased materially during the year. The annual meeting was held in San Francisco in May, with only executive committee members present. Participation by members during 1957 seemed on the increase. Radio, television, motion picture theaters, outdoor advertising, press, commercial editors, business, industry, governmental agencies and other cooperators used available media as in past years.

A large percentage of printed materials used were supplied by protection agencies, the same being true of radio, motion picture theater and television materials. Several organizations produced, used and distributed large quantities of printed materials in addition to those supplied by the agencies.

Privately supported "Keep Green" organizations worked cooperatively with the committee and protection agencies in their educational program. They produced and distributed large quantities of materials but adapted them as a supplement to the statewide program rather than in competition. (Protection agencies recognize the value of the "Keep Green" organizations and commend them for their efforts and cooperation).

For the purpose of providing working materials for private cooperators, and federal, state and county field personnel, the Division produced over 6 million pieces of printed materials, i.e. posters, leaflets, stickers, etc.; eleven TV spots and motion picture trailers from 8 seconds to 2 minutes in length; a 12 3/4 minute educational film, "The Careless Crime" (these were made available to the "Smokey Bear"-C.F.F.P.- campaign for printing and distribution); eight radio program tape recordings, 15 minutes in length for use by radio stations. Prints of trailers were furnished to Fox West Coast Theaters for use in all of their houses, and to other smaller chains and independently owned theaters. Prints of all TV spots were supplied to all television stations.

Four additional talking "Smokey Bear" units were obtained and assigned to District offices. Two additional portable fair exhibits were constructed and used at the state and other fairs.

With new fire prevention personnel made available by the 1957 legislature, we look forward to an improved record of man-caused fire incidence in 1958. A more concerted effort toward reducing incidence by local people who live or work in wildland areas is now possible.

6. LAW ENFORCEMENT:

Law enforcement activities of the Division resulted in 1,991 cases investigated, which were resolved either through court action or by other action satisfactory to the State before going to trial. Of this total 165 were criminal cases, 205 were civil cases, with the remaining 1,621 settled administratively. The following table is presented for comparison with the past six year period:

<u>Year</u>	<u>Man-Caused Fires* State Responsibility Area (Zones 1 & 2)</u>	<u>Criminal Cases</u>	<u>Civil Cases</u>	<u>Administrative Cases</u>
1951	1,858	124	137	1,597
1952	2,058	147	114	1,797
1953	1,932	163	91	1,678
1954	1,955	153	78	1,724
1955	1,801	109	68	1,624
1956	1,566	91	130	1,345
1957	1,895	165	205	1,621

* Clarke-McNary forest fires plus fires occurring in non-Clarke-McNary areas which are the responsibility of the Division of Forestry. Separation of Law Enforcement statistics by area or land ownership is not administratively feasible.

7. INCREASES IN APPROPRIATIONS:

<u>1956-57 Expenditures</u>	<u>Estimated 1956-57</u>	<u>Actual 1956-57</u>	<u>Change</u>
Support	\$ 12,191,378	\$ 11,974,330	- \$ 217,048
Other Current Expenditures	<u>2,389,890</u>	<u>2,302,855</u>	- <u>87,035</u>
Total	\$ 14,581,268	\$ 14,277,185	- \$ 304,083
Capital Outlay	\$ 3,570,619	\$ 1,554,527	- \$2,016,092

<u>1957-58 Budget</u>	<u>Actual 1956-57</u>	<u>Estimated 1957-58</u>	<u>Change</u>
Support	\$ 11,974,330	\$ 14,868,032	+ \$2,893,702
Other Current Expenses	<u>2,302,855</u>	<u>2,776,867</u>	+ <u>474,012</u>
Total	\$ 14,277,185	\$ 17,644,899	+ \$3,367,714
Capital Outlay	\$ 1,554,527	\$ 4,446,577	+ \$2,892,050

Support:

1956-57

Actual Salaries and Wages were less than the estimated amount by \$191,103. Overexpenditures in Administration and nursery program were offset by savings in all other functions, with an overall savings of 2.18%.

Actual Operating Expenses were less than the estimated amount by \$69,843. Savings were distributed fairly evenly among various functions and amounted to 2.20% of the estimated expenditures.

Actual Equipment expenditures exceeded the estimated amount by \$16,276. This overexpenditure occurred chiefly in Field Fire Protection Services, and District Headquarters, with a small amount in Range Improvement. The overexpenditure amounted to 2.21% of the estimated amount.

Reimbursements were less than anticipated by \$53,153. Field subsistence was off the greatest amount, and inmate labor reimbursement was overstated in the estimated budget.

The total savings for 1956-57 in support items was \$217,048.

1957-58

Estimated Salaries and Wages exceed the actual amount spent in 1956-57 by \$1,870,020, or an increase of 21.86%. Much of this amount is due to a general 5% salary increase for most employees. The remaining increase is due to new program and the activation of 2 new Forestry Honor Camps.

Estimated Operating Expenses exceed the total amount spent in 1956-57 by \$605,493, or an increase of 19.49%, mainly in the Field Fire Protection Services and the Honor Camp program.

Estimated Equipment expenditures are higher by \$413,626, or an increase of 55.03%. Most of this is in the Field Fire Protection Services to implement the fire plan.

Reimbursements are expected to increase by \$47,339, mostly attributable to subsistence due to augmentations in field personnel.

The total estimated increase for Support in 1957-58 over 1956-57 is \$2,893,702.

Other Current Expenses:

1956-57

Actual expenditures were \$87,035 less than anticipated for Other Current Expenses. The savings were reflected principally in Emergency Fire Suppression and Forest Insect Control.

1957-58

Other Current Expenses estimated for 1957-58 are more than actual expenditures for 1956-57 by \$474,012. The increase is principally in Contract Counties, and U. S. Forest Service, in accord with implementing the 1956 Fire Plan.

Capital Outlay and Savings:

The decrease in actual expenditures under estimated expenditures in 1956-57 was due to the inability to construct two Honor Camps because of delays in site acquisition.

These camps account for a large portion of the \$2,892,050 increase in the estimate for the 1957-58 year as compared to the actual expenditures in 1956-57.

8. LEGISLATION:

The 1957 Legislature passed the Local Fire District Law which is the successor to the 1881 act relating to fire protection districts in unincorporated areas.

Under this law, a fire district can be formed which may include within the boundaries State responsibility lands in Zones 1 & 2, with the provision that the State will continue to have fire protection responsibility for timbered, brush and grass lands even though these lands lie within the fire district.

If lands are annexed to an existing fire district which has been reorganized under the 1957 Act, the State will continue to have fire protection responsibility for the timbered, brush and grass lands within the area annexed.

9. PROGRESS MADE IN MEETING FIRE PROTECTION
STANDARDS AND OBJECTIVES:

Although it was not the best in recent years either in incidence of forest fires or acreage burned on Clarke-McNary lands in California, the 1957 fire season was not the worst either. Actually the number of fires and acreage burned figures could be slipped into the 1952-56 five year average without disturbing it, as could the average size of all fires. Only in comparison to the unusually fine record set in 1956 does the 1957 record suffer; so in summary, it might be stated that the gains in protection standards noted of the 1952-56 period in comparison to the prior five year period were held in 1957, although not materially improved.

The major cause of large acreage losses still remains in the relatively small percentage of fires which go above one hundred acres before control is achieved. The greatest number of these fires, it has been determined, had progressed beyond ten acres in extent before being attacked--nearly eighty percent of the entire number being above ten acres at the time of attack. Along with this determination it has been discovered that fires of incendiary origin most frequently fall into this group. So the problem of adequate fire control appears to depend upon either prevention of, or rapid attack upon the relatively few fires intentionally and illegally set.

Rapid attack upon incendiary fires is obviously made more difficult by the intentional inaccessibility of the sets, while prevention depends upon educational efforts which vary in different sections of the state. In general, however, timber stands suffer less from this type of fire than brush covered slopes, the ratio of timber to brush acreage losses for the prior five year period being nearly one to thirteen for incendiary fires, while the same ratio for all other causes is just under one to two.

While rapid or effective attack upon incendiary fires is thwarted, there is conclusive evidence to indicate that during the prior decade, attack upon fires of all classifications has increased in effectiveness and volume as, percentage-

wise, the ratio of fires attacked as A and B (under ten acres) has moved upward from about seventy five to eighty five percent of the total numbers of fires.

California Clarke-McNary Lands

<u>Total Fires</u>	<u>Man-Caused Fires</u>	<u>Acres Burned</u>	<u>% C.M. Lands Burned</u>
<u>1947-51 Average</u>			
2505	2167	170,309	.87
<u>1952-56 Average</u>			
2165	1792	127,627	.65
<u>1956 -</u>			
2127	1607	87,868	.45
<u>1957 -</u>			
2038	1895	101,899	.51

10. COOPERATIVE AGREEMENTS FOR PROTECTION OF
STATE AND PRIVATE LANDS:

1. Clarke-McNary Land Protection:

The State Forester contracts, by cooperative agreements, for the protection of Clarke-McNary lands with the U.S. Forest Service and the six contract counties of Kern, Los Angeles, Marin, San Mateo, Santa Barbara, and Ventura, as follows:

C-M Lands Protected by the State	12,945,787
C-M Lands Protected by the U. S. Forest Service	5,245,649
C-M Lands Protected by the Contract Counties	<u>1,618,555</u>
Total	19,809,991

2. Federal Lands Protected by the State:

<u>Agency</u>	<u>Area Acres</u>	<u>Method of Payment to State</u>
Bureau of Land Management Unappropriated Public Domain:		
Zone I	1.185 M.M.	16¢/Acre/Year
Zone 2	.509 M.M.	11.71¢/Acre/Year
Other	.330 M.M.	None
Grazing Lands Zones 1, 2 and 3	.690 M.M.	Fire Cost Reimbursement
U. S. Forest Service	.383 M.M.	
Bureau of Indian Affairs	.268 M.M.	Fire Cost Reimbursement
Other Government	<u>.225 M.M.</u>	None
Total	3.580 M.M.	

3. Total Land Area Directly Protected by State:

* Zone 1 and 2	23,337,768 Acres
** Zone 3 (25 Counties)	9,740,000 Acres

* All State, private and intermingled federal lands, which are directly protected by the State and are primary watershed or timber lands with contiguous secondary watershed and grazing lands. (12.946 million acres are Clarke-McNary.)

** Rural, agricultural, grazing and wildlands not qualifying as State responsibility, but which are protected by the State on an actual presuppression cost basis reimbursed by the county concerned. Each county buys protection desired.

11. NUMBER OF FOREST FIRE FATALITIES:

None during 1957.

12. NATURE AND EXTENT OF MILITARY COOPERATION:

The Division of Forestry received the following assistance from the Military forces during 1957.

1. In Zone I, on 7 fires, 3825 man hours were expended
2. In Zone III, on 24 fires, 239 man hours were expended

